REMARKS/ARGUMENTS

These remarks are filed in response to the Final Office Action dated July 21, 2006. A Response After Final was filed by the Applicants on September 1, 2006, requesting reconsideration of the Examiner's claim rejections. The Examiner issued an Advisory Action September 13, 2006, indicating that the request for reconsideration was not persuasive. The Applicants file this amendment concurrently with a Request for Continued Examination (RCE) and the requisite fee.

The three-month deadline for responding to the Office Action of July 21, 2006 is October 21, 2006. Accordingly, the Applicants respectfully submit that no extension of time fees are due in the connection with this submission. In the event the Applicants are mistaken, the Commissioner is hereby authorized to deduct any required fees and, in particular, any fees due under 37 C.F.R. § 1.17(a) in connection with this and future replies.

As outlined in the Response After Final, the Applicants disagree with the Examiner's interpretation of the claim language of the present application. Nevertheless, to reinforce the Applicants' interpretation, the independent claims have been amended to specify that a "block" is a minimum erasable portion of memory and a "sector" is a minimum writable portion of memory. The amendment is supported throughout the specification as filed. Specific reference may be made to paragraph [0003]. The Applicants trust that this amendment resolves this issue. The Applicants also respectfully submit that this amendment does not constitute a narrowing amendment since it merely clarifies the scope of the language already present in the claims.

In view of the clarifying claim amendments and in view of the reasons set out below, the Applicants respectfully request that the Examiner withdraw his rejection based

upon Parker.

The present application

The present application is directed to a memory device or data structure stored within a memory device that is divided into a static volume and a dynamic volume. Each of the volumes includes a plurality of blocks and each of the blocks includes a plurality of sectors. A block is the minimum erasable portion of memory and a sector is the minimum writable/readable portion of memory. As noted in the background portion of the present application, a problem with flash memory-type devices is that new data cannot be written to a sector without erasing an entire block and re-writing the entire block. A problem that arises in connection with this aspect of flash memory is that if the system loses power during the erase-write procedure, all of the data within the block may be corrupted and/or lost.

Conventional file systems, such as DOS or Unix file systems, rely upon metadata, such as inodes, to store information regarding data files, such as file size and last modification time. If a block of memory contains a dense quantity of metadata, then the loss of that data during an interrupted erase-write operation can be catastrophic for the overall file system.

Accordingly, the present invention proposes that the memory device be divided into a static volume and a dynamic volume, wherein the dynamic volume relates to data that is more frequently updated or changed as compared to the static volume. Within the dynamic volume, each of the dynamic blocks have one sector allocated for metadata and the remaining sectors allocated for regular data. The static blocks may include multiple sectors for metadata with the remaining sectors available for regular data.

Parker

The Parker reference relates to a log-structured file system and flash memory. Log-structured file systems operate on the principle that new data or updated files are appended to the end of the log, hence the depiction in Figures 3, 4, and 5 of a "circular" memory. When a record is updated in log-structured file system, the updated record is appended to the end of the log and the previous version of the record earlier in the log is designated as inactive by switching a validity bit from a one to a zero, which can be accomplished without wholly re-writing the earlier record. One of the problems that arises when using flash memory is the fact that erase operations may only be performed on blocks of memory, whereas read and write operations may be performed at a more fine-grain level on sectors.

The innovations described by Parker include performing a clean-log operation to free-up additional space in the oldest portion of the log. Because erase operations must be performed on a block-sized portion of memory, any records found within an erase block that remain active are copied and appended to the end of the log before performing the erase operation. This allows the memory to consolidate records in an effort to maximize use of the available flash memory.

At column 8, lines 37-44 and at column 11, lines 9-17, Parker suggests that the memory may contain more than one log, and that one of the logs may relate to relatively volatile data records that change rapidly (the "hot" log) and that one of the logs may contain relatively stable records (the "cold" log). Parker does not go on to suggest that either of these logs would have particular sectors allocated for metadata or any other type of data.

Nowhere does Parker discuss the issue of allocating a sector within an erase block

for a particular type of data. Given that Parker relates to log-structured file systems, he is not concerned with the issue of metadata records versus other data. The Parker reference provides no teaching on this point.

Claim rejections

In the Response to Arguments section in paragraph 7 of the Final Office Action, the Examiner argues that Parker teaches the claim limitations in several ways. First, the Examiner argues that Parker teaches multiple logs and that each log reads on the claimed block, since the block is an arbitrary collection of sectors. The amendments to the claims clarify that the term "block" refers to the minimum erasable portion of the memory device. In view of the amendments the Applicants respectfully submit that the multiple "logs" taught in Parker cannot be equated with the blocks claimed in the present application. Instead, Parker's teaching of "hot" and "cold" logs is similar to the claimed dynamic and static volumes in the independent claims of the present application. However, Parker fails to disclose a dynamic volume containing a plurality of dynamic blocks in which each of the dynamic blocks has one of its sectors allocated for writing and reading metadata and the remaining sectors allocated for other data. Parker never suggests the hot and cold logs would be configured or administered any differently in this regard.

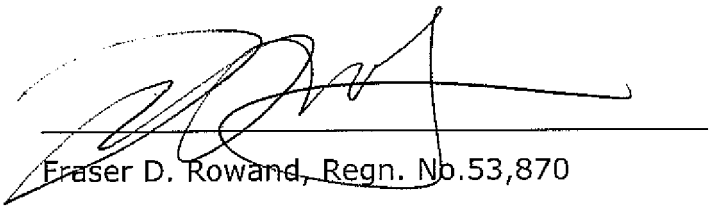
In the Applicants' respectful submission, Parker provides no teaching or suggestion in connection with the allocation of particular sectors within a block for metadata or regular data. In particular, Parker nowhere suggests that the "hot" log (i.e. the dynamic volume) contains a plurality of dynamic blocks wherein each of the dynamic blocks has one of its sectors allocated for writing and reading metadata, and wherein the remaining sectors in the dynamic block are available for writing and reading data, as claimed in the independent claims of the present application.

The Examiner's rejection of the claims in the Final Office Action is prefaced on his interpretation of the term "block" as including any arbitrary collection of sectors. In view of the claim amendments, the Applicants' respectfully submit that this interpretation of the term "block" cannot stand and that the rejections based on that interpretation ought to be withdrawn.

In view of the foregoing submissions, the Applicants respectfully request reconsideration and allowance of the present application. If the Examiner believes that a telephone conversation with the Applicants' agent would resolve any outstanding issues, he is invited to contact Fraser Rowand at 416-868-1482.

Respectfully Submitted,

LIN, Lin, et al.

By: 

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